had caused the violent displacement of the cerebro-spinal fluid and consequent rupture. The same observer had also estimated very minutely the amount required to oppose the arterial tension, and had claimed that if at any time an effusion took place on the surface of the brain, to entirely balance this death must instantly result. Dr. Fisher had pointed out the necessity of maintaining arterial tension, rather than depressing it, upon this very theory. It had been suggested that in cerebral hemorrhage the head should be hung down to mechanically send blood to the head, and thus oppose the effusion which was taking place from the ruptured vessels. He did not know whether this had ever been put into practice.

PHILADELPHIA NEUROLOGICAL SOCIETY.

Stated Meeting, October 27, 1890.

DR. CHARLES K. MILLS in the Chair.

Dr. W. W. KEEN and Dr. F. X. DERCUM gave details of an operation, and the particulars of a case of spasmodic wry neck.

The following is an abstract of the remarks of Dr. Keen upon the operation.[1]

A RESUME OF A NEW OPERATION FOR SPASMODIC WRY NECK, NAMELY, DIVISION OR EXSECTION OF THE NERVES SUPPLYING THE POSTERIOR ROTATOR MUSCLES OF THE HEAD.

BY W. W. KEEN, M.D.,

Professor Principles of Surgery, Jefferson Medical College.

Three years ago, while studying carefully a case of spasmodic torticollis with Dr. S. Weir Mitchell, he asked me, in view of the implication of the posterior muscles of the neck which rotated the head, as well as of the sterno-cleido, whether it would be possible to do an operation for dividing or excising all the supplying nerves. A number of careful dissections determined the feasibility of the operation, and

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[1] The full report will be published in "The Annals of Surgery," for January, 1891.

I have repeatedly done it on the cadaver, and once on the living subject. That case, Dr. Dercum, who kindly referred her to me at the Woman's Hospital for operation, will report fully to the Society this evening.

The chief posterior cervical muscles that rotate the head are the splenius capitis, the rectus capitis posticus major, and the obliquus inferior, of which the last, though not the largest muscle, has the most favorable leverage. The muscles are supplied by the posterior divisions of the first three cervical nerves.

[The anatomical relations of the parts involved were then pointed out, and especially their relations to the sub-occipital triangle formed by the rectus capitis posticus major and the two oblique muscles. The sub-occipital nerve emerges from this triangle, and the vertebral artery lies in it.

The steps of the operation were next described in detail, and it was pointed out that the hemorrhage, though free, was easily controllable, the drainage was perfect in the recumbent posture, and the recovery of the patient was speedy and uninterrupted.]

Those who desire to follow out the anatomy of the region, and the surgical steps attending it will find the details in the "Annals of Surgery" for January, 1891.

Dr. FRANCIS X. DERCUM.—The patient operated upon by Dr. Keen, was a woman, fifty-four years of age, who first presented herself at the University Hospital, March 27, 1886. She then stated that for two years past she had suffered from involuntary rotation of the head towards the left shoulder. As she spoke the movement frequently recurred. The chin turned toward the left and was slightly elevated. In addition, she had distinct hypertrophy of the sterno-cleido-mastoid muscle upon the right side. There was also some diffuse pain at the back of the neck, and at times dizziness, and occasionally headaches, but I could not determine that these were related to the spasm. She was operated upon June 2, 1888, by Dr. Ashhurst, at my suggestion, who removed four inches of the spinal accessory nerve, both branches being embraced in the operation and extreme traction being made upon the trunk. Following the operation the spasms disappeared for a week. They then returned and were apparently unchanged. The frequency was about the same as before. The patient then disappeared from view; but Dr. Keen, having communicated to me that he had devised a new operation for such cases, I wrote to her and placed her under Dr. Keen's care. Dr. Keen operated upon her, as he has described. I saw the patient some time after the operation, and she told me that the spasm had at first entirely ceased, but at the end of one week the movement had returned, but that it was less violent than before. According to my observation, there was decided improvement, the rotation was not so marked, and the head was not moved so violently. She could steady the head with the hand, which was impossible before the operation.

No matter what operation is adopted in these cases, there is some return of the movement, indicating that we have a general condition to deal with, and which probably has its origin in some cortical disturbance. Many muscles are involved in producing this movement of rotation. In studying the subject some years ago, I found that nine different muscles were concerned in the rotation of the head, and at times eleven. It would therefore be impossible to cut all the nerves or to separate the insertions of all the muscles. In the case reported there was certainly improvement, and I think that if the patient had returned to have had an apparatus adjusted, the movement of the head could have been restrained almost entirely.

Dr. W. W. KEEN.—I saw the woman a year after the operation, and she could turn her head towards the left or right and retain it in that position for a considerable time, The trouble had returned, however, to some extent. The reason probably was that some of the nerves of the splenius had escaped division. All the other posterior muscles seemed to be free from contraction. This was the first case in which I performed this operation and I think it was not done as thoroughly as it might have been. It was, however, largely a success, as has been indicated by Dr. Dercum. The range of movement is lessened and its violence diminished; but it is not the complete success that I had hoped for. I propose the operation for trial and for an estimate of its worth. I cannot say that my own mind is made up in regard to this, although I think that it may give a certain amount of relief at least.

Dr. MORRIS J. LEWIS.—As Dr. Dercum has stated, we have many muscles to deal with in this condition. In studying this subject, I have found that according to "Gray's Anatomy," the muscles employed in rotating the head and turning the face to the *left* are situated upon both sides of the neck ; upon the right side they are the sterno-cleido-mastoid, the trapezius, the obliquus superior, and the complexus ; and on the left side, the splenius, the rectus capitis posticus major, the obliquus inferior, and the rectus anticus major and minor. The case which I am about to report, shows the importance of the muscles upon the back of the neck in this rotation of the head, inasmuch as both sterno-cleido-mastoid muscles have been removed, together with the spinal accessory nerves, and yet the lateral movement continues.

SEVERE SPASM INVOLVING MUSCLES OF THE NECK, PERSISTING AFTER REPEATED SURGICAL PROCEDURES AND ACTIVE MEDICAL TREATMENT.

BY MORRIS J. LEWIS, M D.

W. S., æt. 54, shoemaker and turner; denies syphilis. Present trouble began in 1878. Previous to this had been a healthy man. Used tobacco and alcohol in moderation. In 1865 fell on floor during a wrestling-match, his opponent falling on top of his head. In about one-half hour after this he had a good deal of pain in neck, but this soon entirely vanished.

He assigns no cause for his trouble: his first symptom was a tired aching feeling in back of neck and head, without marked twisting of head, except when he would attempt to look steadily at anything, and then his head would pull back and to the left. He does not remember the position of his chin at that time. His condition gradually got worse and worse, until in 1886 there was a continuous "pull of head to left," the chin being up in the air. At this time a seton was placed under the *left* trapezius and allowed to ulcerate through, which it took three weeks to do. This appeared to give temporary relief, but soon the condition was as bad as ever. Then a seton was placed under the sternal head of the *left* sterno-mastoid muscle; this was done two weeks after the former operation.

The position of the head was changed by these operations, but patient could not describe in what manner.

Then a seton was placed under the left splenius, and allowed to cut through. This produced no relief.

Finally a seton was placed under the lower end of right sterno-cleido-mastoid, but this was removed before it had separated. Thirteen weeks were occupied in these operations, and no relief was obtained.

After this, the tonic contraction of the muscles gave way to a clonic spasm of the head to the left, and the pain and discomfort became greater. In 1887, he began to take morphia, and has continued it ever since, sometimes in large doses. In 1887 he applied to the Orthopædic Hospital and Infirmary for relief. Rhigolene freezing of the skin over the right spinal accessory nerve was tried, with apparent good effect, all the symptoms, however, returning with full intensity in a short time.

In November, 1887, Dr. Mitchell admitted him into the hospital, and by his advice the *right* sterno-mastoid was excised and as much as possible of the right spinal accessory nerve removed. This relieved the clonic spasm, but the head still turned to the left as much as ever, the right ear, however, not being so much depressed.

Two weeks later, by some unaccountable mistake, the *left* sterno-mastoid was removed and the left spinal accessory excised. This operation produced no effect other than to weaken his power of turning the head to the *right*. Both the sterno-mastoids were removed in their entirety, not merely cut, and both spinal accessory nerves were removed as far as practicable during the operation. Yet, notwithstanding this, the patient's head turned strongly to the left, although he still possessed the power of turning the head past the middle line to the right.

He was again admitted to the hospital in June, 1890, and was under my care.

His head was turned strongly to left, the chin slightly elevated and four inches to left of median line, the *left* ear being one and three-quarter inches lower than *right*. The fibres of the *left* platysma were very prominent, and the right shoulder was decidedly drawn up.

No clonic spasm could be detected in the neck muscles, and there appeared to be considerable rigidity of the neck, as the head by force could scarcely be turned past the middle line to the right.

By voluntary effort patient could turn the chin one and one-half inches towards the median line, and about one inch further to the left than its usual position. He could elevate and depress the chin with considerable ease. The left omo-hyoid muscle was prominent and could easily be thrown into action. The edge of the left trapezius was tense, and the right still more so, and just anterior to the edge of the right trapezius the processes of the cervical vertebræ could be easily felt.

He complained of a dull, aching pain on the left side of the neck and over the left shoulder.

Neither arm could be raised above the head, although easily extended forward, the left arm being the weaker.

K. J. normal. E. J. present.
Dynamometer, R. 95; L. 95.

A fine tremor was detected in head for first time. He was still taking morphia.

His treatment consisted in weaning him from morphia, and placing him on increasing doses of gelsemium. Under this his general condition improved.

Cutting of the nerves on the back of the neck on the left side was advised, but to this the patient objected on account of the fear of paralysis and loss of control entirely of the head.

The muscles and nerves brought into action in rotating the head and turning the face to the left are, according to Gray and Flower, as follows:

NAME OF MUSCLE.	SIDE EMPLOYED.	NERVOUS SUPPLY.
Sterno-cleido-mastoid.	Right.	R. spinal accessory and deep branches of the cervical plexus.
Obliquus *superior*.	"	R. sub-occipital and great occipital.
Complexus.	"	R. cervical plexus and sub- and great-occipital.
Trapezius.	Left.	Left spinal accessory and deep branches of the cervical plexus.
Splenius capitus.	"	Left ext. post. branches of the cervical plexus.
Rectus cap. post. *major*.	"	Left sub- and great-occipital.
Obliquus *inferior*.	"	" " "
Rectus anticus major and minor.	"	Left sub-occipital and deep branches of cervical plexus.

Dr. F. X. DERCUM.—To the muscles which Dr. Lewis has mentioned, we should add those which are concerned in torsion of the cervical spine. The moment we admit the part which these muscles play, we see how impossible it is to absolutely limit the movement by operation.

SPASMODIC TORTICOLLIS UNSUCCESSFULLY TREATED BY LIGATURING THE SPINAL ACCESSORY NERVE WITH A SILVER WIRE.

BY JOHN B. DEAVER, M.D., and CHARLES K. MILLS, M.D.

This interesting case has been much treated and much reported, and is brought to the Society with the hope that something further in the way of treatment may be suggested—something that will promise success. In a lecture on "Spasmodic Torticollis" by Dr. Mills, in the "University Medical Magazine," February, 1890, and also in an article, entitled "Notes on the Action of Gelsemium in Local Spasm, etc.," by Dr. M. Imogene Bassette, in the "Journal of Nervous and Mental Disease," June, 1890, the case has been fully detailed. Both of these papers can be consulted for the record of the case prior to deciding upon the present operation. In brief, the case was one of a severe type of spasmodic torticollis, beginning some months after injury to the back of the head. She was treated with many remedies internally, and by repeated applications of the actual cautery at the back of the neck, but derived most benefit from frequently repeated and long-continued doses of gelsemium, as has been detailed in the paper of Dr. Bassette read before this Society. At one time it seemed as if a cure had been effected by means of this drug, but the patient was so thoroughly affected by it that it was thought unwise to continue it any further, and its use was finally abandoned. The spasm returned with almost all its old force and intensity. The sufferer, an unusually patient woman, still appealing to me for aid, and having read in the "Lancet" for June 21, 1890, an account of the successful treatment of a case by a silver wire ligature, I suggested to Dr. Deaver to try this operation.

The case in the "Lancet" is reported by Mayo Collier, M.S., Lond., F.R.C.S., Eng. The theory upon which he based his operation was, that as the disease consisted essentially of an excessive intermittent and irregular discharge of energy along the spinal accessory nerve, the introduction of increased resistance in the course of the nerve, and the possible deflection of some of this energy into other structures than the sterno-mastoid and trapezius muscles might result in an abatement or cure of the trouble. Collier's patient was a girl, twenty-one years old, and her affection dated from 1883. It was a most distressing case, the head being violently jerked every two seconds. She had been drugged, galvanized, blistered, and her tonsils removed. Collier cut down on the nerve, used some traction, and then placed silver wire around the nerve as high as he could reach, only twisting the ends to insure a slight compression. The skin was allowed to grow over the ends of the loop. The spasms entirely ceased. The operation was done in January of the present year, and on April 5th the patient wrote to the doctor that she was quite well.

DISCUSSION.

Dr. **John B. Deaver.**—In this case of Dr. Mills' I exposed the spinal accessory nerve at its point of exit from the sterno-cleido muscle, and ligatured it with silver wire, carried well up. The wound healed promptly. The loop of wire is encysted, and it occasions no inconvenience. In the light of Collier's result. This is a justifiable operation and worth repetition in this case, at least before adopting any other procedure.

I consider the operation devised by Dr. Keen a severe one, and not entirely justifiable procedure; not, at any rate, till other operative means have been tried. It certainly exposes a comparatively important part of the body, and, in the light of Collier's result, would it not be wise to try his (Collier's) operation, which does not involve any risk and does not leave the patient any worse?

Dr. **W. W. Keen.**—I should like to make a few remarks in connection with this subject. A bad case presented itself at the Orthopædic Hospital on Saturday last. It was in a young child, and it was evident that several muscles were involved. The rotator muscles of the spine were affected, as well as the muscles of rotation of the head. Under the sterno-cleido muscle there was a mass of muscles which were tense and hard. These I took to be the scalene muscles, which aided in pulling the neck and head over to the right side. The levator anguli scapulæ was also involved. There was spasm of the sterno-cleido-mastoid muscle of one side, and of the posterior cervical muscles of the other side.

The whole question is a complicated one. Two years ago, when Mr. Horsley was in this country, I went over this matter with him, and we debated quite seriously the question of excision of the cortical centre for rotation of the head. I confess that I have never yet had the courage to do this operation, partly because I am in doubt whether it would reach so extensive a movement as that presented by Dr. Mills, where the muscles of both sides are affected, although very probably the function of this centre is bilateral. If a serious case presented itself to me, in which the annoyance and discomfort were of such a character that I thought it right to run any reasonable risk, I should recommend this excision of the cortex, especially if other operations had been done and failed, presuming of course that all medication had been tried. I think, however, that the position of the cortical centre of rotation of the head has not yet been ascertained with such accuracy that we can dogmatize.

Dr. James Hendrie Lloyd.—If Dr. Keen can, I wish he would tell us more definitely the position of this centre. In a recent lecture, Ferrier, referring to localization of the trunk muscles, finds their centres in the mesial aspect of the brain. He finds that excision of the centre of one side does not completely paralyze the trunk muscles. It seems to me that this would be an important point in connection with these cases. The muscles involved in torticollis might act as the trunk muscles do, and be paralyzed completely only by excision of the centres on both sides. Again, Ferrier says that lateral movements of the head and eyes have their centres in the frontal region and are not capable of being permanently paralyzed unless every portion of the frontal region be completely destroyed—a very formidable operation. In regard to its being a local central lesion in wry neck, that of course is still a matter to be decided; but I think all of us who have seen these obstinate cases of torticollis and have failed to obtain the slightest therapeutic result, and have seen all these extensive peripheral dissections made and peripheral treatment tried to the fullest extent, must feel that with such extensive associated movements as these, the chances are that we have not gone far enough back, and that the trouble is probably one located in the cortical centres.

Dr. W. W. Keen.—In reply to Dr. Lloyd I would say that I have to-day received a copy of Ferrier's book, and I have not yet had time to read it. Mr. Horsley's view was that this centre lay on the lateral aspect of the hemisphere, and not on the mesial; and Ferrier's former view at least was the same. In the case reported by Dr. Mills I should be inclined to follow the suggestion of Dr. Deaver, to expose the nerve and again ligate it. I cannot exactly see the rationale of the operation; but as it has cured in one instance, it is worthy of a second trial.

It is scarcely just to refer to the operation I have described as a severe one; although it involves a number of muscles and nerves, yet the area is not nearly as large as that of many tumors which we remove without the slightest fear. There is not the least operative or post-operative risk, to my mind. If in Dr. Mills' case re-ligation of the nerve fails, I should advise the operation, which I have described, on the right side. I would rather do that than excise the cortical centre. If that did not succeed, it would be then a question whether the more radical operation should not be attempted.

Dr. G. BETTON MASSEY.—I know of nothing more obstinate than these inveterate cases of torticollis. If anything can be done surgically, it should be welcomed. I should advise more extensive exsections before concluding that the case was hopeless. Certainly the reports carry a certain grain of hope in them. I have looked at this affection as largely psychical, however, especially the clonic variety. One case that came under my observation some years ago seems to bear out that view. The spasm was much the same as in the case of Dr. Mills. This case resisted the most thorough treatment of all kinds, and finally went home and got well under the influence of exercise and fresh air.

FAILURE OF SCIATIC STRETCHING FOR A TYPICAL CASE OF SYMMETRICAL LATERAL SCLEROSIS.

BY DRS. W. W. KEEN AND CHARLES K. MILLS.

This patient, a young married woman, when she first came for treatment, had the symptoms of an incipient symmetrical lateral sclerosis, the disease being in such an early stage that some doubt existed as to whether we had not to deal with an hysterical rather than an organic spasmodic tabes. The sole symptoms were exaggerated knee-jerks, slight ankle clonus, stiffness in the lower extremities, with a slightly halting and stumbling gait. Here was a good opportunity, if ever, of curing spinal sclerosis, and the patient was told that we would try to exhaust the measures known for its treatment. She proved a persevering patient, staying with Dr. Mills for several years, during which time she was treated with all manner of drugs, with galvanism, massage and the cautery, and for several months by forcibly stretching of the limbs without cutting down on the nerves. With the assistance of Dr. J. B. Roberts at one time she was etherized in order more thoroughly to carry out this method of sciatic stretching. In spite of all efforts she got slowly but surely worse, and finally Dr. Keen stretched both sciatics after incision.

The operation was performed on December 13, 1883, by Dr. Keen, the strictest antiseptic precautions being observed. The nerves were exposed by an incision just below the gluteal folds. A strong flat, curved hook was introduced beneath each nerve, which was stretched first in one direction and then the other. The stretching was completed by suspending for a moment the entire leg by the hook placed under the nerve. Recovery from the operations was rapid and perfect. After the effect of the ether passed off, she had some numbness at the plantar surface of the left foot, most at the toes, and also slight loss of sensation along the outer edge of the sole of the foot. The plantar reflexes were exaggerated, but ankle clonus, which was present before the operation, had disappeared. The knee-jerks were still marked but less so than before the operation. Spontaneous tremors in the limbs were present at times, and she had occasionally pain in the left knee and ankle. These were the only points of interest in connection with the case after operation.

The woman remained for many months under observation. Her gait and reflexes seemed for a few weeks slightly better, but the improvement was neither marked nor permanent. The disease re-asserted itself, and steadily although very slowly got worse until she passed from observation.

TWO CASES OF SUCCESSFUL SCIATIC-STRETCHING.

BY DRS. CHARLES K. MILLS AND JOHN B. DEAVER.

The following cases are worthy of being reported, as in both the severe and long continued pain was relieved by operation :

Case I.—This patient was an electrotyper, 32 years of age, without a history of syphilis, constitutional disease or abuse.

About three years before he came under observation, he was in the habit of frequently riding the bicycle, particularly in the evenings. Three months after beginning this amusement, which may, or may not, have had to do with his affection, he noticed pain in the under part of the left thigh This persisted from day to day, and from week to week; it gradually increased in intensity. The pain seemed to start at a point about half way between the hip and the knee in the back of the thigh. It would extend in both directions from this point, so that the painful and uncomfortable sensation would reach the bottom of the foot, and in the other direction the sacral region. At times he would have considerable numbness and tingling in the leg, particularly below the main focus of pain. He described the pain as being at times excruciating.

For three years before coming to the reporters he was treated by various physicians. Among other measures which were thoroughly tried, were electricity, both faradism and galvanism, the actual cautery, and many internal remedies, such as iodide, the salycilates, and antiperiodics, as arsenic, quinia, etc., also numerous anodynes. A course of massage and Swedish movements had also been tried, and he had been subjected to hypodermic injections.

He suffered mostly with this pain in the evening, and when sitting down during the day. When moving about the pain gradually decreased, and he was sometimes hardly aware of it, but it never absolutely left him.

We found that the pain was still most severe at the original spot about midway of the posterior thigh ; that some numbness and tingling followed the posterior external aspect of the leg downward to the foot. Lately it seemed as if the pain had increased in the upper thigh and in the gluteal regions. On pressure no tenderness was present. We also made a careful examination by the rectum for the condition of the sacral plexuses, to determine whether or not a growth or any morbid condition was present in the pelvis. Nothing was discovered.

As the patient had already been treated by almost every measure promising success, except nerve stretching, after explaining this operation to him he consented to have it done.

With strict antiseptic precautions, Dr. Deaver exposed the nerve for several inches at the place of the greatest pain. No tumor could be detected. Some thickening and inflammation of the nerve sheath was present for about an inch and one-half or two inches. After opening the sheath and loosening the thickened bands, the nerve was carefuly stretched by pulling it strongly first in one direction and then in the other.

It is unnecessary to go into the details of the subsequent condition of the patient. He suffered while in bed from various nervous symptoms the result of timidity and a nervous temperament. In about two weeks he was again on his feet. For several weeks he had the symptoms of traumatic neuritis in the sciatic distribution below the seat of the operation—spontaneous pain, and hyperæsthesia along the nerve distribution, and pain on lateral squeezing of the foot, but the old pain was gone.

After a few weeks of treatment with mercurial and belladonna ointments, salicylates, tonics, rest and hot applications, the neuritis which had resulted from the operation disappeared. He was also free from the old pain, and has remained so up to the time of making this report.

Case II.—T. J., aged 25, laborer, patient in the nervous wards of the Philadelphia Hospital, had been irregular in his habits, and was addicted to the abuse of alcohol, drinking, according to his way of putting it, "everything that came in his way." He never had had syphilis. In February, 1890, he complained of soreness of the hip and thigh. This soreness increased over the back of the leg and thigh, and in the upper portion of the foot; he also had a tingling and numbness in the lower part of the leg and foot. This was greatly increased by exertion or pressure. Lying in bed greatly relieved him, and, in consequence, for the sake of the comfort which he obtained, he often remained in bed two or three days at a time. In walking, semi-flexion of the leg apparently relieved the intense pain. Latterly this pain had extended to the gluteal regions.

For several months he was treated with the usual remedies which are employed in sciatic neuritis, including iodide, anti-periodics, salicylates and hypodermic injections of morphia and atropia. He improved somewhat, but no decided relief was obtained.

September 3, 1890, he was removed to the surgical wards of the hospital, where Dr. Deaver exposed and stretched both sciatic nerves. At first he had some of the neuritic discomfort which followed the other operation, but after a week he began to decidedly improve. In less than a month he was entirely free from pain in the leg and thigh.

SUTURE OF THE PERONEAL NERVE.

BY JOHN B. DEAVER, M.D.

This is the only case of secondary suture of the peroneal nerve of which I can find any account. In Bowlby's book, if my memory serves me correctly, I find that secondary nerve suture has been practised a number of times in the upper extremity, and only once in the lower extremity.

The history of the case is as follows:

At the battle of Sharpsburg, 1862, J. R., aged twenty years, was struck over the trochanter major of right side with an iron ball, penetrating to the bone; this was immediately followed by intense pain, causing patient to fall to the ground speechless. Upon rising and attempting to put right foot to the ground, he was again attacked with pain. Ten days later, when turning over on the left side to have the wound dressed, he suffered from pain, referred to outer side of knee of corresponding side. Four months from time of injury he resumed his duties in the army, being but little inconvenienced by the wound.

A year or two after the close of the war he noticed a small lump on outer side of right knee, which when struck caused pain, referred along the course of the branches of the external popliteal or peroneal nerve. The swelling slowly increased in sensitiveness and in size till it was about as large as a small English walnut. In April, 1890, the lump, which was evidently a neuroma (it was not examined microscopically), was removed by his family physician—no anæsthetic being used. The ends of the nerve were not sutured. This operation was followed by paralysis of the extensor muscles of the leg.

He wrote to a number of prominent surgeons; but they all disapproved of any operation. He came into my hands, when I thought it proper to make the attempt to suture the divided ends. I went to Virginia July 1st, and exposed the nerve, removing the two bulbar extremities, and sutured the ends with catgut and aseptic silk. On account of the amount of nerve removed, it was necessary to place the limb at an obtuse angle. The patient made an uninterrupted recovery, barring an attack of traumatic neuritis. As a result of this he became addicted to morphia.

Some months after the operation he came to Philadelphia, at my suggestion, and received electrical treatment with electricity, massage, and other measures under Dr. Mills. Sensation had returned. When he went back to Virginia the limb was almost straight, but there had been no recovery of motion.

There is no question but that the nerve has united. It can be distinctly felt, and pressure at the seat of suture causes pain along the musculo-cutaneous and anterior tibial branches. I believe that in the course of a year or two motion will be recovered. In the cases given by Bowlby, there are only one or two in which motion returned before the lapse of fifteen months.

I have here the two ends of the nerve. Bowlby states that the proximal end of the nerve is bulbous, and the distal end filamentary. Here both extremities are bulbous and united by fibrous tissue.

DISCUSSION.

Dr. CHARLES K. MILLS said that he treated this man for three or four weeks. He made a careful electrical examination, and found the reactions of degeneration. There was also active neuritis. This was treated by mercurial and belladonna ointment, freely applied, and the internal use of salicylates and tonics, with rest part of the time. Hot douches were also employed. This was followed by improvement. He examined the man frequently, and on one or two occasions thought that there were signs of return of motion in the muscles. His impression was that the man would eventually get back power in these muscles. The time that he was under treatment was not sufficient. Before the man returned to his home he was provided with an apparatus similar to that used in club-foot, the result of peroneal palsy; and with this he was able to get along pretty well.

Dr. W. W. KEEN thought that it would be important to have a microscopical examination of the bulbous extremities removed, to determine the presence or absence of nerve tissue. This should be done before any opinion was expressed upon the results of the operation.

One lesson that this case teaches distinctly is, that in all such cases the cut ends of the nerve should be at once united. This cannot be too strongly insisted upon. The profession should be educated up to this point. If the two ends had been united at the time of the removal of the neuroma, the chances of a useful limb would have been excellent.

TRIGEMINAL NEURALGIA OF LONG STANDING RELIEVED BY AN OPERATION.

REPORTED BY DRS. J. B. DEAVER AND CHARLES K. MILLS.

This patient was a man between seventy and eighty years of age. For many years he had been a carrier of newspapers, and constantly exposed to all kinds of weather. Several years before he came under care, he began to suffer with severe pain in the side of the face beneath and above the eye, and sometimes in front of the ear. The history of the case was the usual one of a gradually augmenting trigeminal neuralgia, or tic douloureux.

Many remedies were used by various physicians before he came to Dr. Mills. One of the branches of the fifth nerve had been resected by Dr. F. D. Gross. He was treated by Dr. Mills for several weeks, with galvanism, counter-irritants and internal medicines, including among others large doses of aconitia, which gave him temporary relief.

The patient was admitted to the Polyclinic Hospital and was operated upon by Dr. J. B. Roberts, for several months he was entirely free from pain. He then began to suffer again, and the attacks gradually increased both in severity and frequency, until soon they were practically continuous.

Applying again for treatment, he was admitted to the wards of Dr. Deaver, in the German Hospital.

Dr. JOHN B. DEAVER.—In this case of trigeminal neuralgia, the patient had been operated on twice—once by Dr. Roberts and once by Dr. Gross. My experience is that in these cases it is useless to do an operation on the terminal part of the nerve. I have operated on two cases particularly interesting. One of these was of two years standing and had been treated in Chicago, New York, and in this city. I removed the superior maxillary nerve with Meckel's ganglion. The operation was the ordinary Carnigan's operation. The man has been entirely relieved. The second patient, similarly treated, also has been well for two years.

HORSLEY'S NEW ROLANDIC FISSURE METER

was exhibited by Dr. W. W Keen.

Dr. JOHN B. DEAVER.—What advantage has this instrument over the plan formerly used in locating this fissure? I have had occasion to make a number of observations in regard to the position of the fissure of Rolando with Dr. Agnew, and every time we found the fissure of Rolando without trouble. I think that the fewer instruments we have the better.

Dr. CHARLES K. MILLS.—What I think is probably of as much importance as this question of the angle of the fissure of Rolando is the position of the fissure in persons of different ages and different mental capabilities. A difference of almost, if not quite, an inch may be found according to the development of the brain with reference to age and mental capacity.

Dr. FRANCIS X. DERCUM.—I am in accord with Dr. Mills as regards the relation of the fissure of Rolando to the general brain development, but I also believe that there is a distinct relation between the angle of the fissure of Rolando and the cranial index. From my own studies, I have no doubt that the angle is greater in brachycephalic, and smaller in dolichocephalic skulls.

Dr. W. W. KEEN.—I am not sufficiently informed to speak of the exact relation between the varying angle and the cranial index. If, as I believe, the fissure of Rolando does change its angle, it is of importance to have a rotatory arm, particularly in operations at the lower end of the fissure. A slight variation of one or two degrees may be of slight importance in the upper part of the fissure, but when we come to its lower extremity, such a variation will make a considerable difference. If we also neglect to take into account the genu of this fissure we may be one and a half or two centimetres out of our reckoning.

PROBABLE LESION OF THE POSTERIOR MEDIASTINUM.

BY CHARLES K. MILLS, M.D.

This patient is of great interest in many ways; in one, as showing the method of evolution of a diagnosis.

J. E., aged forty-three, white, male, a park guard, was first seen on March 6, 1890. He had been in the hands of many physicians.

When he first appeared he was a robust-looking, well-developed man. His chief complaint was of severe pain in a spot about one to two inches below the inferior angle of the left shoulder-blade, with the arms at rest and pendant. At first the pain was scarcely noticeable, but later it became more persistent and its exacerbations more frequent. He was always worse in the afternoon and evening, apparently the result of exertion. The pain was increased to some extent by lifting a heavy weight, as a coal-scuttle or a bucket of water. As a peculiar manifestation, he complained that it hurt him to sneeze, unless he threw his head far back. When the pain was most severe it appeared to pass around and behind the ribs. Occasionally it reached to the middle line of the spine. After lying down for some time, he improved.

The pain was described as a dull, gnawing, grumbling sensation; but, as already stated, he at times had temporary decreases and exacerbations, some of the latter of a darting character. He thought that talking, particularly if he spoke loudly, caused him to have a catch in the region of the pain. He sometimes had difficulty in getting his coat and other garments off and on.

The man was taken to the Polyclinic, and carefully examined by Dr. H. A. Wilson and the writer, with a view of determining whether he could have incipient caries; but the examination resulted negatively. I was inclined to the operation of cutting down upon the nerve and excising it, or perhaps tracing it back, in search of a lesion, to its origin in the vertebral canal.

Dr. Deaver saw the man, and arrangements were made for his admission to the German Hospital; but he preferred to wait, and to go on with medicinal treatment, counter-irritants, etc. He was treated by me for several weeks with no decided benefit. He then passed out of my hands.

Returning again to me about the middle of October—in the meantime having been treated by hypodermic injections, cauterization and in other ways—his condition was found to be much worse.

The most prominent symptom was still the grumbling, persistent pain below the shoulder-blade. The exacerbations were more violent, and the pain showed a tendency to radiate and diffuse. Occasionally he complained of pains leading to the spinal column behind. More frequently some pain passed upward between the left shoulder-blade and the vertebral column; again, at times, the pain passed up to the shoulder and down the arm.

He had now decidedly lost flesh, his weight having fallen twenty to thirty pounds. Several weeks before he came to me, an irritating cough had shown itself. This was not accompanied with much expectoration; occasionally it showed a little frothy mucus. He had frequent attacks of difficulty of breathing, even on moderate effort, and could not, without great dyspnœa, attempt any great exertion or violent effort. Heart palpitation occasionally occurred, and lately he had had frequent attacks of sweating, local in character and confined to the side of the head and neck. His expression was anxious, at least as compared with his former complaisant and healthful appearance. The left pupil was a little smaller than the right.

Being still somewhat uncertain of the nature of this painful disease, I brought him before the Philadelphia Neurological Society, submitting him to the members for examination and diagnosis.

[He was examined by nearly all the members present, among others by Drs. J. B. Deaver, T. J. Mays, James Tyson,

J. H. Lloyd, Morris Lewis, W. W. Keen, J. Madison Taylor, F. X. Dercum, J. P. C. Griffith, and G. B. Massey. Several suggestions were made, among them were aneurism of the thoracic aorta, neuroma, local neuritis, tuberculosis, and a probable small spinal unilateral growth, and local meningeal inflammation.]

Since the meeting the patient has again been examined by Dr. Mays and myself, and with him I have concluded that all the symptoms in the case are best explained by a lesion in the posterior mediastinum. The notes of Dr. Mays will be given at the conclusion of the report.

When the contents and relations of the posterior mediastinum are considered, it will be seen that, to explain the symptoms and progress of the affection, a lesion of the cavity would be the most reasonable diagnosis. Bounded in front by the pericardium and root of the lungs, behind by the spinal column, on either side by the pleura, the contents of this cavity are, in the first place, the two great nerve trunks, the pneumogastric and splanchnic nerves. Besides these, it contains the thoracic aorta, the azygos veins, the œsophagus, the thoracic duct and lymphatic glands. Irritation of the splanchnic and of the pneumogastric nerves with the recurrent laryngeal will explain such symptoms as change in the pupil, local sweating, etc. The persistent pain at its original seat, and the diffuse pain, is explicable on the theory of direct or indirect involvement of the spinal-thoracic nerves, which are connected with the splanchnics. Ross, of Manchester, has shown the connections of the sympathetic and the cerebro-spinal nerves with reference to the localization of pain, in lesions of the viscera, or the circum-visceral, or intra-visceral spaces.

If the location of the lesion be correct, the character of it is uncertain, as no aneurismal bruit has been heard. We may have a thoracic aneurism, a sarcoma, a lymphoma, tubercular disease of the nerves, or even vertebral caries, or vertebral cartilaginous or ligamentous disease. I believe it is possible to operate with a chance of success in a case of this kind, and I have suggested an operation to the patient.

After careful examination of this patient, Dr. Thomas J. Mays reported upon him as follows:

"Physical examination of this patient shows undue prominence of the upper part of the left chest, which is associated with a pulsating tumor, about one and a half inches square, located at the junction of the first intercostal space with the sternum. Over this tumor there is marked dulness, which shades off toward the left and downward into a diminished percussion resonance. Over this dull area a diastolic murmur is heard, which is probably generated in the aortic valve. No systolic murmur anywhere. No asymmetry of the radial pulses, nor of the femoral and radial pulses.

"The respiratory sounds are partially suppressed in the whole of the left apex; whereas, in the right apex, there is puerile respiration. Some sibilant and mucous râles exist in the upper part of left lung.

"In coming to a conclusion concerning the nature of this trouble, I think it is evident that we have to deal with a growth or enlargement in the upper part of the chest and extraneous to the lung. There are no signs which indicate the existence of an aneurism, and I am of the opinion that there is a growth, probably lymphomatous or sarcomatous, in the posterior mediastinum pushing forward the arch of the aorta, and compressing the left bronchus, the left pneumogastric and the sympathetic chain on the same side. Whether the pain at the posterior base of the left chest is caused by this enlargement directly or in a reflex manner, I am not able to say, because there are no physical signs on the back to indicate whether the tumor extends down that far or not."

REMARKS ON TWO CASES SIMULATING HYDROPHOBIA AND OCCURRING AFTER DOG-BITES.

BY CHARLES K. MILLS, M.D., AND CHARLES J. HOBAN, M.D.

REMARKS BY DR. MILLS.

Owing to the grave importance of the subject to the comfort of society as well as its medical interest, it is well that cases alleged to be of hydrophobia in man should be placed for discussion before the profession. The weight of opinion is still in favor of the existence of a specific disease known as hydrophobia, both in the lower animals and in man, and the labors of Pasteur and his disciples have apparently given this affection bacteriological standing, but so carelessly and so recklessly are cases that will not bear scrutiny reported as hydrophobia, that immense harm has been done both to the community and to the cause of science. In an article on "Cases with Hydrophobic Symptoms," published jointly with Drs. James Collins and Carl Seiler, in the "Philadelphia Medical Times," July 31, 1880, I directed attention to the fact that many of the cases reported as hydrophobia in man were really affections of a different character, the biting of a dog being merely a coincidence or the cause of a non-specific nerve affection like tetanus or reflex epilepsy. Among other diseases I then referred to as closely simulating hydrophobia were localized meningitis, tumors of the oblongata and floor of the fourth ventricle, epilepsy, tetanus and hysteria. This doctrine was not new with me. The elder Hammond had some years before contended that hydrophobia might be a nerve disease from the beginning, and the hypothesis is even as venerable as Democritus, who described hydrophobia as an inflammation of the nerves. During the last decade much interest has been awakened in the subject of pseudo-hydrophobia, and prominent in this work have been Dr. C. W. Dulles, of this city, and Dr. E. C. Spitzka, of New York, who seem inclined to take the advanced ground that hydrophobia is not a disease of man. Whether or not this view is correct, their work is deserving of commendation because of its tendency to counteract the tide towards nervous hydrophobia.

The first of the two following cases was seen by me in consultation with Drs. J. J. Healy, C. Wirgman and C. W. Dulles; the second with Dr. C. J. Hoban, who will report the case in full. In both were clear histories of dog-bites. Both were alleged to be cases of hydrophobia, but unfortunately a post-mortem examination could not be obtained in either. I do not believe that either was a case of genuine hydrophobia, for various reasons, but chiefly for two, namely: (1) While *some* of the symptoms in both corresponded to the description of hydrophobia in man, others were not at all of this character; (2) The symptoms in both cases could be much more readily explained by the supposition of a localized gross organic lesion. We have no right to conclude that a case is one of hydrophobia simply because the patient has a prior history of having been bitten at some period, near or remote, by a dog or other animal, but rather we should carefully exclude other possibilities before hazarding a conclusion so dangerous, directly and indirectly.

CASE I.—W. S., a young man, was seen in consultation December 27, 1880. His first symptoms had shown themselves three days before; but he had been bitten in the right hand several months previously. His first symptoms were general nervousness, irritability, apprehension, crying, and complaints of pain and weakness in his right arm. In a short time he lost power in the right arm. His chief symptoms, when he was examined jointly by Drs. Healy, Wirgman, Dulles and myself, were, in the first place, difficulty in swallowing water and other liquids. When, on urging, he attempted to drink, the liquid ran out of his mouth, because of paresis (not spasm) of some of the oral, facial and pharyngeal muscles. He had full control over the masseter, pterygoid and temporal muscles. The uvula was slightly deflected to the left and was congested, but it and the throat showed no deposit. The tongue was not paralyzed or paretic. The right upper extremity was partially and yet markedly paralyzed. His speech was slightly drawling and nasal, but he was not aphasic. He was a left-handed man. No loss of sensation was anywhere present; neither had he any hyperæsthesia. Temperature in right axilla 102.4°; in left axilla, 102.4°. The heart action was fairly strong, without murmur, but with a roughness with second sound at the base. The right radial artery seemed smaller than the left, but no compensatory enlargement of the vessels of the other side could be determined. His tongue was heavily coated. He had no history of syphilis or traumatism. The patient died with symptoms of exhaustion and increasing respiratory difficulty within twenty-four hours after the consultation.

CASE SIMULATING HYDROPHOBIA AND OCCURRING SOME MONTHS AFTER A DOG-BITE.

By C. J. HOBAN, M.D.

H. S., male, age 5; head rather hydrocephaloid in appearance, showing no growth during last two years. When three month old had diphtheria, followed by whooping-cough. Both parents of nervous character, particularly father, who has had three attacks of mental trouble, during one of which he was under care of Dr. Mills. Had one attack about two years be fore birth of this child. Lost one child one year old, a twin, under somewhat similar circumstances, having, however, no paralysis, dying in convulsions after an illness lasting twenty-four hours.

This child was bitten by a dog not supposed to be mad in the early part of March, present year. There were several lacerations, which bled slightly, on left hand. Wounds were washed with bichloride solution and carefully cauterized with aq. No. 3. Next day a few of the wounds were filled with pus, but in a few days were completely healed, leaving in time no scars whatever.

Was perfectly well up to October 3d, the beginning of his last illness. On October 3d at noon, the child complained of soreness in left wrist, the bitten hand; said that hand was tired. This tired feeling gradually extended up his arm, and by supper time there was complete paralysis of left arm, but no distinct pain was complained of. Parents applied arnica and iodine, but these gave no relief.

October 4th showed no change, nor did the following day. The boy kept running about as usual; went to Sunday-school and complained of nothing but loss of power in arm. On Sunday evening, October 5th, he complained of pain in left shoulder and became restless. On following morning, October 6th, I was sent for, and saw him for the first time about 1 P. M. Then there was complete paralysis of left arm, some pain, he said, in shoulder and neck. Was able to walk and run about, could eat and swallow as usual, but was somewhat nervous.

Pressure on arm, shoulder or neck gave no evidence of pain, no swelling was anywhere apparent. I looked upon it as a case of brachial paralysis, probably rheumatic in origin. Prescribed for it as such and said that he would recover the use of the arm in a few days. That evening I was sent for again about 7, and found that he had great difficulty in swallowing his medicine or any kind of liquid; there was also difficulty in swallowing solid food. Any attempt to swallow would be followed by spasmodic action of the larynx and œsophagus and part of the liquid would be thrown from the mouth again. At this time he was very nervous, and when I left he refused to make any attempt to swallow.

Saw him again on morning of October 6, and learned that he passed a very restless night, having no sleep, nor did he take any medicine or food. He was now most extremely nervous; the least noise or movement on the part of any one present would bring on marked convulsive movements of the entire body, more marked in the upper extremities.

Pupils were widely dilated, pulse beating 180 times per minute and respiration very markedly increased. Mind was perfectly clear during all this, and the little patient would smile from time to time and declare that he had no pain.

On examination of his lungs, I found that they were rapidly becoming œdematous and respiration was getting difficult. Large quantities of saliva and mucus were secreted and expectorated in a foamy condition.

At 3 P. M., Dr. Mills saw him and found all these symptoms still more increased. In fact the child was so nervous now, that during examination he passed into such a convulsion that we expected him to die immediately.

His face became decidedly cyanosed, his lungs and trachea were filled with mucus so that it was barely possible for him to breath. However, on lowering his head and elevating his feet, he emptied his respiratory apparatus and again breathed with some difficulty.

He remained in this condition, having convulsive movements every few minutes until 7 P. M., when he died, perfectly conscious until within a few minutes of death.

The immediate cause ot the death was cardiac and respiratory failure.

The cause of the paralysis of the arm and cardiac and respiratory failure is what I would like to learn to-night.

The evening the child died I thought I had a solution for all the symptoms, and wrote to Dr. Mills to that effect. In his answer he said my theory might be correct, but would be open to some criticism ; and after giving the subject more attention, I certainly agree with him as far as the criticism is concerned. On looking over the plates in the fifth volume of Pepper's System of Practical Medicine, I located the brachial centre in the medulla oblongata, and putting this with the fact that the cardiac and respiratory centres are situated here and pressure on these would cause loss of function, I had an easy solution to all the symptoms. But on more reading, I find that the brachial centre is not so situated and of course my explanation as to the paralysis of the arm will not hold.

My theory was that there was a tumor situated near the medulla oblongata, which pressed first upon the brachial centre, causing the paralysis of the arm. This tumor by its rapid growth soon pressed upon the centre of the pneumogastric, causing the nerve to lose its inhibitory action over the heart ; hence the rapidity of the pulse ; pressure also on the pneumogastric would cause the lungs to lose the power to throw off the mucus which accumulated so rapidly; hence the œdema.

But why tumor? In the first place the boy had no pain in head, nor any head symptoms whatever, and we can therefore exclude meningitis, cerebral effusions, and I think apoplexy. There was no cardiac trouble. and we may exclude embolism. Again, there was no pain in brachial plexus or arm, and hence we can exclude neuritis involving the plexus.

In the strict definition of the word, the child did not have hydrophobia, yet he had some of the symptoms of rabies, such as the foaming at the mouth, the pharyngeal and laryngeal spasms, the snapping at the towel when clearing his mouth of saliva, the peculiar noise made by attempts to rid his mouth of saliva, likened by one of the bystanders to the snarling of the dog. All these he had, but yet when we remember that there was paralysis of the left arm before any and all of the other symptoms, we cannot look upon it as a case of rabies.

Dr. JAMES HENDRIE LLOYD.—It seems to me a very violent assumption to consider that any of these clinical cases, either prove or disprove the existence of hydrophobia. If this disease exist it can be proved only by prolonged labors in the laboratory. I do not believe that newspaper reports or researches in libraries among musty books will settle the question. I suggest that when a physician gets a sensational case of so-called hydrophobia, he secure the cord and give it to a competent bacteriologist for study and experiment. Only in this way can we arrive at definite results. It is extremely improbable that fright produces death in the cases of so-called pseudo-hydrophobia. Fright is a constant phenomenon in human society, and its effects are very well understood. It would certainly be strange if it produces, as is asserted, such characteristic hydrophobic symptoms only after a dog-bite. Such a thing is not credible. It is probable, rather, that many reported cases have been badly observed, and have been cases really of delirium or maniacal excitement due to some infectious process in the brain.

Dr. G. BETTON MASSEY.—I have now a case presenting many of the symptoms detailed, referred to me by Dr. Chas. Martin of Allentown. Two years ago, when the acute attack occurred, the symptoms were much the same as those of Dr. Hoban's case. There is now paresis of both arms without involvement of the nutritive condition, nor change in the normal response to electricity. At the beginning there was decided involvement of the throat and voice with a pulse at about 140. At present the pulse is 115 or 120. I consider the case to be one of lepto-meningitis of the upper part of the cord with a certain amount of pressure. If this individual had died early, it would probably have furnished food for the newspapers.

Dr. CHARLES K. MILLS.—I think that Dr. Lloyd's remarks are rather calculated to cloud the importance of these clinical reports of cases. I have reported several cases in which autopsies have been made. All the cases reported in the newspapers are sensational. Many of them come from France. It must be remembered that nineteen out of every twenty cases of so-called hydrophobia are undoubtedly not instances of this disease. There is a hydropho-hydrophobia which is the result of these reports. Both of these cases were spoken of by individuals as hydrophobia, and if for one moment assent had been given to this idea, the reports of the cases would have been sent broadcast throughout the country. These cases, as nearly all that I have seen, were clearly cases of something else.

Adjourned.